WELDING PROCEDURE QUALIFICATION TRAVELER PQT No. _____

LANL Welding Program

PART I: To be Completed by the LANL FWO Welding Program Administrator

A. Code Edition and Addenda:

☐ ASME Section IX: Edition:_____ Addenda:_____

☐ AWS D1.1: Edition:_____ Addenda:_____

☐ Other Applicable Documents: _____

_____

_____

B. Base Metal:

1. Material Spec., Type & Grade: _____ to _____
2. ASME P-No. and Group: _____ to _____
3. Carbon Equivalent:_____ to _____
4. Thickness of Weld Test Coupons: _____ to _____
5. Diameter (if applicable): _____ to _____
6. Type of Backing:_____
7. Other Requirements:_____

_____

_____

C. Weld Filler Metal:

1.	ASME Specification:	Root _____	Fill _____
2.	AWS Classification:	Root _____	Fill _____
3.	ASME Weld Metal Analysis A No.:	Root _____	Fill _____
4.	ASME Filler Metal Group F No.:	Root _____	Fill _____
5.	Filler Metal Size:	Root _____	Fill _____

Continued on next page

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D. Welding Process and Welding Parameters:

1. Process:

   Root:_____ Number of Passes Over Root:_____

   Fill:_____

2. Shielding Gas: _____ at _____ CFH

3. Back Purge Gas: _____ at _____ CFH

   For Number of Passes _____

   O_2 Content of Purge Gas Before Welding _____ CO_2

4. Preheat Minimum: _____ °F

5. Interpass Temperature: _____ °F maximum (achieve for at least one pass)

6. Electrical Characteristics: (List By Welding Process)

   Process _____ Current _____ Polarity _____ Transfer Mode _____

   Process _____ Current _____ Polarity _____ Transfer Mode _____

7. Bead Placement Technique: _____

8. Single Pass or Multipass Technique: _____

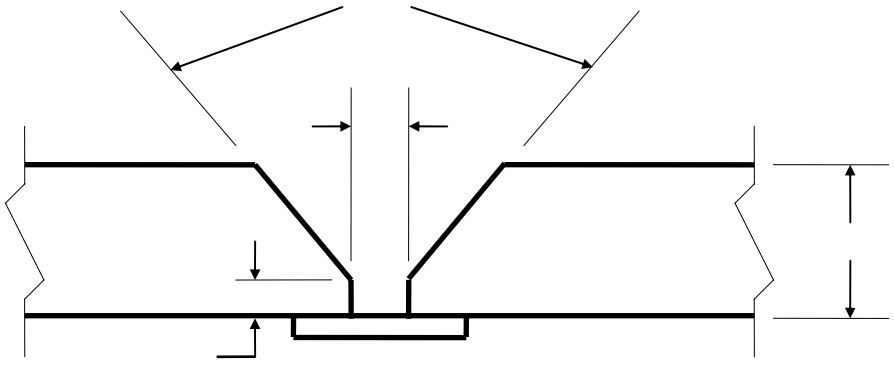
9. Welding Position to be Tested: _____

   Type of Progression: _____

10. Amperage, Voltage and Travel Speed (per Welding Process and Filler Wire Diameter)

Process	Pass	Filler Metal Diameter	Amps (If Pulsed, Give All Parameters)	Volts	Travel Speed (IPM)	Shield Purge/Gas	Cup Size

11. Joint Design to Use



WELDING PROCEDURE QUALIFICATION TRAVELER PQT No. _____

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12. Post Weld Heat Treatment: (PWHT) ☐ Yes ☐ No

Temperature: _____ °F

Time At Temperature: _____ hr

PWHT Procedure To Be Used: _____ Rev. _____

E. Tests to be Performed:

1. Mechanical Test:

a. Tensile Tests (QW-150): ☐ Yes ☐ No

Number of Specimens: _____ Type: _____ Per Fig.: _____

Location of Specimens: _____

Acceptance Per: _____ psi

b. Bend Tests (QW-160): ☐ Yes ☐ No

Number of Side Bend Specimens: _____ Per Fig.: _____

Number of Face and Root Bend Specimens: _____ Per Fig.: _____

Location of Specimens: _____

Acceptance Per: _____

c. Toughness Tests (QW-170):

(Charpy V-Notch) ☐ Yes ☐ No

Test Temperature: _____ °F

Number of Specimens: Base Metal: _____ Weld Metal: _____ HAZ: _____

Location of Specimens: _____

Per Figure: _____

Minimum Acceptance: _____ Ft-Lbs _____ Mils Lateral Expansion

2. Metallographic Tests

a. Macro Etch Section Tests: ☐ Yes ☐ No

Number of Specimens: _____

Inspected at: _____ % magnification

Acceptance Per: _____

b. Hardness Transverse Tests: ☐ Yes ☐ No

Number of Specimens: _____

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WELDING PROCEDURE QUALIFICATION TRAVELER PQT No. _____

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c. Magnetic Verification of Delta-Ferrite Tests: ☐ Yes ☐ No

Number of Specimens: _____

☐ In-Process-50% Weld Level

☐ Completion

Acceptance Per: _____

d. Sensitization Tests: ☐ Yes ☐ No

No. of Specimens _____

Acceptance Per: _____

3. Nondestructive Tests: ☐ Yes ☐ No

Radiographic: _____

Acceptance Per: _____

4. Other Required Tests: _____

_____

_____

_____

_____ _____

LANL FWO Welding Program Administrator **DATE**

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WELDING PROCEDURE QUALIFICATION TRAVELER PQT No. _____

LANL Welding Program

PART II: To be Completed by the LANL FWO Welding Program Administrator

A. Welder Assigned: _____

B. Start of Welding Date: _____

C. Test Facility: _____

D. Pre-Test Inspection:

1. Material Verification:

	Specification	Manufacturer (Trade Name)	Heat/Lot No.	Carbon Equivalent
Base Metal				
Base Metal				
Insert Metal				
Backing Strap Material				
Purge Gas				
Shielding Gas				AWS Class
Filler Metal (Root)				
Filler Metal (Remainder)				
Tungsten Electrode				
Flux				

2. Type of Coupon: ☐ Pipe ☐ Plate

3. Pipe OD: _____ Schedule: _____ Thickness: _____

4. Test Position (QW-461): ☐ 1G ☐ 2G ☐ 3G ☐ 4G ☐ 5G ☐ 6G

5. Joints (QW-402):

Type: _____ Root Opening: _____

Included Angle: _____ Root Face: _____

6. Instrumentation

	Oxygen Analyzer	Amp Meter	Volt Meter	Shield Gas Flow meter	Purge Gas Flow meter
Serial No.					

Continued on next page

WELDING PROCEDURE QUALIFICATION TRAVELER PQT No. _____

LANL Welding Program

7. Fit-up: ☐ Satisfactory ☐ Unsatisfactory
8. Pre-test Cleaning: ☐ Satisfactory ☐ Unsatisfactory

Verified By: _____ Date _____

E. In-process Inspection:

1. Purge: Oxygen Analyzer Reading: _____
2. Preheat Temp:. _____
3. Welding Progression: ☐ Uphill ☐ Downhill
4. Current Type and Polarity

SMAW	☐ DCRP	☐ DCSP	☐ AC	
GTAW	☐ DCRP	☐ DCSP	☐ AC	
GMAW	☐ DCRP	☐ DCSP	☐ AC	Transfer Mode: _____
FCAW	☐ DCRP	☐ DCSP	☐ AC	Transfer Mode: _____
Other: _____	☐ DCRP	☐ DCSP	☐ AC	

5. Wire Feed Rate for GMAW _____
6. Type of Welding: ☐ Manual ☐ Semi-automatic ☐ Automatic
7. Verify:
   a. All passes were less than ½ in. Thick: ☐ Yes ☐ No
   b. Supplemental filler metals used: ☐ Yes ☐ No
   c. Supplementary powdered filler metals used: ☐ Yes ☐ No
   d. Root retainers used: ☐ Yes ☐ No
   e. Trailing shielding gas used: ☐ Yes ☐ No
   f. In-process weld peening used: ☐ Yes ☐ No
   g. Rolling direction to weld: ☐ Parallel ☐ Perpendicular
8. Initial and interpass cleaning method: _____
9. Backgouging performed: ☐ Yes ☐ No

   Method of backgouging: _____

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WELDING PROCEDURE QUALIFICATION TRAVELER PQT No. _____

LANL Welding Program

10. Document weld parameters (for each pass): See Weld Parameter Sheet, Pages 8 and 9

    a. Record on the weld parameter sheet for each pass the welding current information, travel speed, shielding gas information, interpass temperature, and bead placement technique (stringer or weave).

    b. Prepare a sketch on the weld parameter sheet showing the weld joint configuration. Identify each weld pass location and sequence on the sketch.

11. Record the maximum interpass temperature: _____

    At least one pass was completed at the maximum interpass temperature: ☐ Yes ☐ No

12. Post Weld Cleaning: ☐ Satisfactory ☐ Unsatisfactory

Verified By: _____ Date _____

Continued on next page

WELDING PROCEDURE QUALIFICATION TRAVELER

PQT No. ______________

LANL Welding Program

WELD PARAMETER SHEET

			Filler Metal			Travel	Purge			Shield		Interpass	Bead
Date	Pass	Process	Size	Amps	Volts	Speed	Gas	Flow	O_2 %	Gas	Flow	Temp	Type

WELDING PROCEDURE QUALIFICATION TRAVELER PQT No. _____

LANL Welding Program

WELD PARAMETER SHEET													
							Purge			Shield			
Date	Pass	Process	Filler Metal Size	Amps	Volts	Travel Speed	Gas	Flow	O_2%	Gas	Flow	Interpass Temp	Bead Type

Bead Pattern Sketch

Other

In-process Inspection Complete:

_____ Date _____

WELDING PROCEDURE QUALIFICATION TRAVELER PQT No. _____

LANL Welding Program

F. Final Inspection:

Visual Inspection: ☐ Satisfactory ☐ Unsatisfactory

Verified By: _____ Date: _____

G. Post Weld Heat Treatment Time-Temperature: (Attach Recording Chart)

☐ Satisfactory ☐ Unsatisfactory ☐ N/A

Temperature:_____°F Duration:_____hours

Verified By: _____ Date: _____

H. Test Specimen Preparation:

Verify the number of test specimens, specimen geometry, size, location, and orientation are documented for the following:

Tensile Tests:	☐ Satisfactory	☐ Unsatisfactory	☐ N/A
Guided Bend Tests:	☐ Satisfactory	☐ Unsatisfactory	☐ N/A
Toughness Tests: (Charpy V-Notch)	☐ Satisfactory	☐ Unsatisfactory	☐ N/A
Macro Etch Section Tests:	☐ Satisfactory	☐ Unsatisfactory	☐ N/A
Other:_____	☐ Satisfactory	☐ Unsatisfactory	☐ N/A

Verified By: _____ Date: _____

I. Mechanical Test Results:

1. Tensile Tests (QW-150):

Specimen No.	Dimensions		Area (sq. in.)	Ultimate Total Load (lbs.)	Ultimate Tensile Strength (ksi)	Location and Type of Failure
	Width	Thickness				

WELDING PROCEDURE QUALIFICATION TRAVELER PQT No. _____

LANL Welding Program

2. Guided Bend Tests (QW-160):

Type and Figure No.	Results

3. Toughness Tests (QW-170):

Specimen No.	Notch Location	Specimen Size	Test. Temp.	Impact Values		
				(Ft.-Lbs.)	% Shear	Mils

J. Metallographic Test Results:

1. Macro Etch Section Test Results:

Inspection Magnification: _____

Findings: _____

2. Hardness Traverse Test Results:

Location	Base Metal	HAZ	Weld Metal	HAZ	Base Metal
Root					
Mid Weld					
Crown					

3. Magnetic Verification of Delta-Ferrite Tests Results:

50% Weld Level: _____

Completed Weld: _____

WELDING PROCEDURE QUALIFICATION TRAVELER PQT No. _____

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4. Sensitization Test Results:

_____

_____

_____

_____

K. Nondestructive Tests:

Radiography: ☐ Accepted ☐ Rejected

Film Interpreted by: _____

If Rejected, explain problem: _____

_____

L. Other Required Tests:

_____

_____

_____

M. Laboratory Test Data and Results Certified Correct:

_____ _____

LANL FWO Welding Program Administrator **DATE**